

WHAT IS CLAIMED IS:

1. A method for identifying a compound as a candidate for a herbicide, comprising:
  - a) contacting a FHT with a compound; and
  - b) detecting the presence and/or absence of binding between the compound and the FHT, wherein binding indicates that the compound is a candidate for a herbicide.
2. The method of claim 1, wherein the FHT is a plant FHT.
3. The method of claim 2, wherein the plant FHT is an *Arabidopsis* FHT.
4. The method of claim 3, wherein the FHT is SEQ ID. NO. 2.
5. A method for determining whether a compound identified as a herbicide candidate by the method of claim 1 has herbicidal activity, comprising: contacting a plant or plant cells with the herbicide candidate and detecting the presence or absence of a decrease in growth or viability of the plant or plant cells.
6. A method for identifying a compound as a candidate for a herbicide, comprising:
  - a) contacting a compound with at least one polypeptide selected from the group consisting of: an amino acid sequence comprising at least ten consecutive amino acids of a plant FHT, an amino acid sequence having at least 85% sequence identity with a plant FHT, and an amino acid sequence having at least 80% sequence identity with a plant FHT and at least 50% of the activity thereof; and
  - b) detecting the presence and/or absence of binding between the compound and the polypeptide, wherein binding indicates that the compound is a candidate for a herbicide.

7. A method for determining whether a compound identified as a herbicide candidate by the method of claim 6 has herbicidal activity, comprising: contacting a plant or plant cells with the herbicide candidate and detecting the presence or absence of a decrease in growth or viability of the plant or plant cells.

8. A method for identifying a compound as a candidate for a herbicide, comprising:

- a) contacting a naringenin, 2-oxoglutarate, and O<sub>2</sub> with a FHT;
- b) contacting the naringenin, 2-oxoglutarate, and O<sub>2</sub> with the FHT and a candidate compound; and
- c) determining the concentration of at least one of naringenin, 2-oxoglutarate, and O<sub>2</sub>, and/or 3-dihydrokaempferol, succinate, and CO<sub>2</sub> after the contacting of steps (a) and (b).

9. The method of claim 8, wherein the FHT is a plant FHT.

10. The method of claim 9, wherein the plant FHT is an *Arabidopsis* FHT.

11. The method of claim 10, wherein the FHT is SEQ ID. NO. 2.

12. A method for identifying a compound as a candidate for a herbicide, comprising:

- a) contacting naringenin, 2-oxoglutarate, and O<sub>2</sub> with a polypeptide selected from the group consisting of: a polypeptide having at least 85% sequence identity with a plant FHT, a polypeptide having at least 80% sequence identity with a plant FHT and at least 50% of the activity thereof, and a polypeptide comprising at least 100 consecutive amino acids of a plant FHT;
- b) contacting the naringenin, 2-oxoglutarate, and O<sub>2</sub> with the polypeptide and a compound; and

c) determining the concentration of at least one of naringenin, 2-oxoglutarate, and O<sub>2</sub>, and/or 3-dihydrokaempferol, succinate, and CO<sub>2</sub> after the contacting of steps (a) and (b).

13. A method for identifying a compound as a candidate for a herbicide, comprising:

- a) measuring the expression of a FHT in a plant or plant cell in the absence of a compound;
- b) contacting a plant or plant cell with the compound and measuring the expression of the FHT in the plant or plant cell; and
- c) comparing the expression of FHT in steps (a) and (b).

14. The method of claim 13 wherein the plant or plant cell is an *Arabidopsis* plant or plant cell.

15. The method of claim 14, wherein the FHT is SEQ ID NO 2.

16. The method of claim 13, wherein the expression of FHT is measured by detecting FHT mRNA.

17. The method of claim 13, wherein the expression of FHT is measured by detecting FHT polypeptide.